Blue Force Tracking – What's new?

Satellite is a key enabler for government and military groups the world over, delivering unparalleled capabilities both at home and abroad. From keeping military commanders up to date in the field, enabling heads of government to securely conduct international affairs, and to allowing officials to respond to local emergencies, satellite provides vital voice, imaging, video, data and connectivity services the world over. While in previous years, many governments had stalled or cut their space programme budgets, a turn-around in investment is expected soon, prompting satellite service providers to ramp up their offerings.

A GPS-enabled system that providers military forces and their commanders with location information of friendly (blue) and hostile (red) forces, Blue Force Tracking (BFT) makes a huge difference to the warfighter in the field. BFT systems usually include a satellite terminal, antenna, GPS receiver, computer, command and control software, and mapping software. Capabilities include reporting battlefield locations and conditions such as mine fields or other obstacles, route planning tools with proximity warnings, and displays that show the location of the host vehicle, blue forces and red forces. Newer BFT systems also allow users to send a receive text and imagery.

Blue Force Tracker-1 (BFT-1) and Blue Force Tracker-2 (BFT-2) are used by most ground and aviation vehicles in the US Army today. Although they fulfil the same function, each operates over its own dedicated satellite channel. The original BFT-1 was built by Northrop Grumman in the 1990s, and was hailed as a massive benefit to situational awareness in the Iraq War. However, limitations included communications delays of up to five minutes, and the inability of GPS to penetrate into buildings.

ViaSat launched the BFT-2 network several years ago to deliver faster position, location and information (PLI) refresh rates, as well as greater data throughput capabilities. Operating around 10 times faster than BFT-1, the newer system enables almost real-time accuracy, with 99.95 percent network availability, a key factor for the US Army. Ground vehicle and aviation transceivers operate over ground station equipment installed at L-band satellite provider sites and are controlled by satellite NOCs. The ground vehicular transceiver is a single Line Replaceable Unit (LRU), while the aviation transceiver is a two-LRU design that separates the antenna and RF assembly from the modem assembly to offer better aerodynamic performance. Both transceivers have successfully completed MIL-STD-461, 464, and 810 testing.

Blue Force Tracking developments

In 2016, we heard how the US Army was testing a new channel-sharing capability for Blue Force Tracker-1 and Blue Force Tracker-2 to reduce costs. Currently, both BFT systems combine command and control software, satellite transmissions, GPS capabilities and other elements, but operate over different satellite channels. Sharing a single channel is expected to reduce satellite costs by as much as 60 percent, keep infrastructure replenishment expenses in check, and make the BFT system easier to use by eliminating the need to shift between different hardware and software set-ups when working between the two BFT systems.

The US Army's channel-sharing tests, which culminated in an operational test on both ground and aerial vehicles at the Communications-Electronics Research, Development and Engineering Center (CERDEC) Intelligence and Information Warfare Directorate (I2WD) Flight Activity, evidenced channel-sharing as a practical alternative to the current approach. The single-channel plan will be built into the next generation of Blue Force Tracker, currently known as BFT-2.5, while market research for more advanced antennas, processors, modems and transceivers is currently ongoing prior to the system launch, although there's been no news in quite some time on any further developments.

A 2nd Brigade, 1st Armoured Division Soldier uses the Joint Capabilities Release of Force XXI Battle Command Brigade and Below/Blue Force Tracking during the Army's Network Integration Evaluation 12.1. JCR provides a "bridge" to Joint Battle Command-Platform, which will bring features such as detailed touch-to-zoom maps and drag-and-drop icons as well as a new level of situational awareness for dismounted Soldiers. (Photo Credit: Claire Schwerin, PEO C3T)

The Mounted Family of Computer Systems introduces a standardized family of tactical computers that are scalable and tailorable to the mission. Soldiers will be able to operate the Army's primary situational awareness capability, Joint Battle Command-Platform, as well as other command, control, communications, computers, intelligence, surveillance and reconnaissance applications. (Photo Credit: Photo courtesy of DRS Tactical Systems Inc.)

Comtech Telecommunications Corp. has had quite a busy year in terms of BFT contracts with the US Army. In April 2017, Comtech Telecommunications' Comtech Mobile Datacom Corporation subsidiary was awarded a five-year contract with a not-to-exceed value of US$42.7 million to continue to provide sustainment support for the US Army's Project Manager Mission Command (PM MC) – BFT-1 programme.

Under the new five-year BFT-1 sustainment contract, Comtech will perform engineering services, satellite network operations and programme management through a hybrid Firm Fixed Price (FFP)/Time & Materials (T&M) contract with Cost Reimbursement CLINs. The base performance period began on 15 2017 and ends on 14 April 2018, and the contract provides for four twelve-month option periods exercisable by the US Army. The total estimated value of the base year is US$8.0 million. The US Army placed an initial funded order of US$3.5 million under this contract, and in May 2017 was awarded contract modifications of US$4.2 million, bringing the total base year value to US$7.7 million to date.

"We are pleased that Comtech has again been selected to work together with the US Army to sustain this critical worldwide military communications system. The award of this contract further demonstrates the ongoing importance of the US Army's BFT-1 satellite tracking communication system," Fred Kornberg, President and Chief Executive Officer of Comtech Telecommunications Corp.

Later in September 2017, Comtech Telecommunications' Comtech Mobile Datacom Corp. subsidiary was awarded a five-year FFP, Indefinite-Delivery/Indefinite-Quantity (IDIQ) contract for providing BFT-1 Aviation Terminals to the Defense Logistics Agency (DLA). Under this contract, the DLA will procure Comtech's AVX-06-203 Aviation Satellite Communication Transceivers. This contract has a single five-year base period from 20 April 2017 through 19 April 2022 and a maximum value of US$4.2 million.

Meanwhile, October 2017 saw Comtech Telecommunications' Comtech Mobile Datacom Corp. subsidiary awarded a FFP US$6.5 million contract from the Consortium Management Group (CMG) to support the US Army PM MC and the BFT-2 programme.

Phase 1 execution, which totals US$1.2 million, is to port additional waveforms onto the current BFT-2 transceiver to allow it to be used in austere operational environments. The final objective requires the ability to quickly change to different waveforms based on changing operational environments and requirements. Upon phase 2 and 3 execution, the total value for these additional phases is US$5.3 million. The US$6.5 million contract is expected to be completed within seventeen months.

The contract vehicle utilized for this award is pursuant to an Other Transaction Agreement (OTA) between C5 and the US Army Contracting Command-New Jersey. The OTA enables the US Army to direct a coordinated research and development programme designed to develop prototype command, control, communications and computer technologies directly relevant to weapon systems information technologies.

US Army rejects Win-T Increment 2

BFT currently uses commercial satellite connectivity, and we reported last year that the ultimate intention was to bring it into the Warfighter Information Network-Tactical (WIN-T). Whether that remains the case has not been made clear in the wake of the latest news.

In a sudden move in September 2017, the US Army informed Congress that it didn't want to go ahead with the 10-year old Warfighter Information Network – Tactical (WIN-T) (Increment 2), and requested that the money designated for its procurement, some US$544 million, be redistributed.

WIN-T is the US Army's tactical telecommunications system delivering command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities that are mobile, secure, survivable, seamless, and capable of supporting multimedia tactical information systems. Systems development and integration for WIN-T started back in 2002, and was divided into four increments (1, 2, 3 and 4) in 2007 following a restructuring. The US Army mostly relies on WIN-T (Increment 1), even though WIN-T (Increment 2) underwent tests as long ago as 2012. Increments 3 and 4 are absent.

Following a one-year review of various tactical networks ordered by US Army Chief of Staff Gen. Mark Milley, Lt. Gen. Bruce Crawford, the US Army's Chief Information Officer, told Congress that WIN-T is too vulnerable to hacking, and takes too long to get set up and running.

"After almost a year of careful review… we have come to the conclusion that the network we have is not the network that we need to fight and win against a peer threat in a congested or contested environment," said Lt. Gen. Bruce Crawford. "Our current network does not meet our warfighting needs now, nor do we believe it will meet the future warfighting needs of a high-intensity conflict."

Gen. Mark Milley asserted that while WIN-T is adequate for low-tech 'static' battlefield situations such as Iraq or Afghanistan, the system will become a liability in case of all-out war with 'near-peer militaries,' since it is too susceptible to jamming, and takes 40-50 hours on average to set up. Lt. Gen. Bruce Crawford, meanwhile, explained to Congress that the US Armed Forces are impeded by bloated and lengthy procurement operations to buy new technologies, with the process strung out for years, or even decades. Within such an environment, it is impossible to keep up with adversaries in terms of technological development.

The programme has already cost some US$6 billion, which Congress has said will be squandered if WIN-T (Increment 2) is rejected. However, Lt. Gen. Bruce Crawford has stated that the US Army still wants to deploy capabilities and elements of Increment 2, but US$413.8 million of the funding would be best used to fix the network's most pressing interoperability and security concerns, while the remaining US$131.1 million would be used to adapt and buy unidentified 'better systems.'

Onto the next big thing

US defence forces are already looking to the next big thing in BFT capabilities. The US Army and US Marine Corps are currently partaking in the Joint Battle Command Platform (JBC-P) programme, which was designed to provide military leaders greater command, control and situational awareness than ever before.

"JBC-P is the Marine Corps primary command, control and situational awareness tool for the battalion and below," said Capt. Jamie Claflin, JBC-P Project Officer at MCSC. "It allows the commander to see friendly forces in his area of responsibility in real time including other services, and also provides situational awareness data that is reported into the common operating picture."

JBC-P delivers faster satellite communications using BFT-2, a high-speed GPS satellite network 10 times faster than the previous system that delivers secure encrypted transmissions and vastly reduces reaction times thanks to the lower latency. BFT-2 uses Inmarsat's I-4 satellite constellation to gain much more bandwidth with higher data rates (up to 120kb on the forward link and up to 3kb on the return link), drawn from new transceivers. JBC-P is also integrated with the Tactical Intelligence Ground Reporting (TIGR) system, which provides historical intelligence data, including area structures, obstacles and previous incidents for a given site.

"JBC-P also features a multi-function screen with mapping and message management environments," said Ignacio Filgueira, Lead Engineer for JBC-P at MCSC. "Operators can select different functions including a real-time chat room capability where they can send and receive messages, use icons on a map that show other JBC-P-equipped vehicles, position information, adversaries, threats and shared SA and C2 capability with JTCW."

The joint nature of the JBC-P enables greater cooperation between the US Army and US Marine Corps. With both forces using the same software, the Army's Network Operation Centre (NOC) can oversee all BFT operations and enable greater cooperation between the two forces, enhancing both operational and cost efficiencies.

"Today, through JBC-P, Soldiers and Marines are no longer burdened by operating with two separate command and control/mission command systems," said Lt. Col. Shane Sims, the Army's Product Manager for JBC-P. "By using the same system, the Marine Corps and Army know where each other are in relation to the enemy. JBC-P enables them to communicate on missions together, which is a huge tactical and operational advantage over our adversaries."

JCB-P was initially slated for full roll-out by 2026, but the US Army is ramping up fielding in the face of high demand for the improved systems. In August 2017, it was announced that JCB-P and the US Army's new standardized tactical computer, the Mounted Family of Computing System (MFoCS), will be rolled out to all Reserve and National Guard units by 2024.

Initially, the US had planned to save money by fielding legacy hardware, JV-5, to 60 percent of units, and the newer system, MFoCS, to the remaining 40 percent of units. However, the older hardware was eventually ruled out in order to reduce software and hardware baselines, improve cyber protection, and reduce costs by eliminating sustainment of older systems. MFoCS is available in a variety of forms, including a detachable tablet and a vehicle-mounted workstation. The US Army plans to have 98,000 MFoCS systems in the field by 2024.

In order to meet the new reduced timeframe, PM MC is increasing the size of its training and fielding teams and ramping up vehicle hardware and software platform procurement. As of August 2017, JBC-P had been field-tested to 17 units with an additional 18 units slated for the 2018 fiscal year. From the 2019 fiscal year, 50-70 units will be fielded annually. **GMC**

Photo courtesy of US Army